

Notice of Allowability

Application No.

09/688,764

Applicant(s)

DENG ET AL.

Examiner

Art Unit

Michael N. Opsasnick

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/7/05.
2. ☒ The allowed claim(s) is/are 1,3-12,15,16,18-24,28,29 and 32-34.
3. ☒ The drawings filed on 16 October 2000 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 1/10/05;6/18/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Allowable Subject Matter

1. Claims 1,3-12,15,16,18-24,28,29,32-34 are allowable over the prior art of record.
2. The following is a statement of reasons for the indication of allowable subject matter: As per independent claims 1,12,22,24,33,34 the recited limitations pertaining to the generation of mixture components (which are derived from the noise channel vectors -- pp 22 of the specification), in combination with the generation of correction vectors, (as detailed on pp 19, lines 1-14 of the specification), is not explicitly taught by the prior art of record.

With respect to the prior art of record, it is old and well known to take measurements of “clean” and “noisy” speech channels, and to use that information to improve the accuracy of the speech recognition channel. For example, under applicant’s admitted prior art (pp 3 of the specification), noisy correction vectors are generated by subtracting noise channel vectors from clean channel vectors, and then applying this correction vector to a training signal or test signal. In other areas of prior art, noisy feature vectors are compared to clean channel feature vectors to identify a mixture component that best aligns with the feature vector, however, such alignment is not ideal since the comparison is to clean channel feature vectors, not noisy channel feature vectors. One detailed example of the prior art of record is Trompf et al (5758022), wherein stress related variations in speech vectors are compared to stress-free speech vectors for training the neural network, and also applying a third type of speech vector to account for background

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noise (col. 3 lines 40-55). Moreno et al ("Multivariate Gaussian Based Cepstral Normalization for Robust Speech Recognition, 1995, IEEE), teaches adding to the mean and variance of clean speech vectors the mean and variance components of noisy speech vectors to calculate a compensation factor to account for the noise background during actual speech recognition (pp 138), with the correction terms being in the form as shown on pp 139, equations 12, and 13. Neumeyer et al ("Probabilistic optimum filtering for Robust Speech Recognition", 1994 IEEE Conference on Acoustics, Speech, and Signal Processing) teaches mapping clean and noisy speech features (page I-418, col. 1-2). However, these correction terms are not based upon derivation from noisy speech channels, nor of the same structure as covered in the scope of the recited claim language above. Furthermore, it would not have been obvious to one of ordinary skill in the art of speech noise modeling to modify the teachings of the prior art of record to obtain the recited claim limitations of the independent claims as listed above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872 9314,

(for informal or draft communications, please label "PROPOSED" or "DRAFT")

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Hand-delivered responses should be brought to Crystal Park II, 2121
Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Opsasnick, telephone number (571)272-7623, who is available Tuesday-Thursday, 9am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Mr. David Ometz, can be reached at (571)272-7593. The facsimile phone number for this group is (571)272-7629.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 2600 receptionist whose telephone number is (571) 272-2600, the 2600 Customer Service telephone number is (571)272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

5/1/05
mno



DAVID L. OMETZ
PRIMARY EXAMINER